37420 Safflower

Prepared at the 49th JECFA (1997)
superseding specifications prepared at the 31st JECFA (1987), published in FNP 38 (1988)

SYNONYMS	Safflower yellow, CI Natural Yellow 5 - Carthamus Yellow
DEFINITION	Carthamus Yellow is obtained by extracting the corolla (petals) of *Carthamus tinctorius* L. with water or slightly acidified water and drying the extract. The principal colouring matters are safflomin A (hydroxysafflor yellow A) and safflomine B (safflor yellow B). Besides the colour pigments carthamus yellow consists of sugars, salts and/or proteins naturally occurring in the source materials. Food grade materials such as dextrin may be added as carriers for manufacturing dry, powdered items of commerce.
Class	Flavonoid
C.A.S number	I. 78281-02-4 (Safflomin A) II. 120478-62-8 (Safflomin B)
Chemical formula	I. $C_{27}H_{32}O_{16}$ (Safflomin A) II. $C_{48}H_{54}O_{27}$ (Safflomin B)
Formula weight	I. 612.5 (Safflomin A) II. 1062 (Safflomin B)
Assay	Content of colouring matter not less than declared
DESCRIPTION	Yellow to dark brown crystals, paste, powder or liquid with a faint characteristic odour.
FUNCTIONAL USES	Colour
CHARACTERISTICS	
IDENTIFICATION	
Solubility	Very soluble in water, practically insoluble in ether and ethanol
Spectrophotometry	A solution of the sample in citric acid/disodium hydrogen phosphate buffer solution (pH 5.0) is yellow and shows an absorption maximum at 400-408 nm.
Colour reaction	Make the solution of the sample in water alkaline by 10% sodium hydroxide solution; the colour changes from yellow to orange-yellow
Thin layer chromatography	
	Carthamus yellow appears as two main yellow spots with Rf-values in the range of 0.2-0.5 See description under TESTS
PURITY	
Lead	Not more than 10 mg/kg

Kremer Pigmente GmbH & Co. KG · Hauptstr. 41-47 · DE-88317 Aichstetten ·Tel. 0049 7565 914480 · info@kremer-pigmente.com · www.kremer-pigmente.com

	Prepare a sample solution as directed for the organic compounds in the Limit Test, using 10 μg of lead ion (Pb) in the control
Synthetic dyes	Passes test See description under TESTS
TESTS	
IDENTIFICATION TESTS	
Thin layer chromatography	
	Activate cellulose for 20 min at 60-80°C and prepare a TLC plate. Prepare a 10% solution of the sample in methanol and apply 20 μl to the plate. Allow to dry and develop using a mixture of n-butanol, acetic acid and water (4:1:2 by volume) until the solvent front has ascended about 10 cm. Allow to dry. The main components of carthamus yellow appear as two yellow spots with Rf values in the range 0.2-0.5.
PURITY TESTS	
Synthetic dyes	Basic dyes: To 1 g of the sample add 100 ml of 1% sodium hydroxide solution, and mix well. Extract 30 ml of this solution with 15 ml of ether. Then extract the ether layer twice with dilute acetic acid (5 ml); the dilute acetic acid layer does not contain any colour. Acidic dyes: To 1 g of the sample add 1 ml of ammonia TS and 8 ml of water, and shake well. Discard an oily layer when separated. Proceed as directed under *Paper Chromatography (Ascending Chromatography)* in the *General Methods* using 20 μl of the solution as the sample solution, and a mixture of pyridine and ammonia TS (2:1 by volume) as the developing solvent. Stop the development when the solvent front has advanced about 15 cm from the point of application. No spot is observed at the solvent front after drying under daylight. If any spot is observed, it should be decolourized when sprayed with a solution of stannous chloride in hydrochloric acid (2 in 5).
METHOD OF ASSAY	Transfer about 0.15 g of the sample, accurately weighed, in a 100-ml volumetric flask; dissolve in and dilute to volume with citric acid/disodium hydrogen phosphate buffer solution (pH 5.0). Transfer 5.0 ml of this solution to a 100-ml volumetric flask; dilute to volume with the buffer solution, and centrifuge if necessary. Determine the absorbance (A) at 400 nm in a 1-cm cell with the buffer solution as a blank and calculate the percent of colouring matter (P) with the following formula:  in which W is the weight of the sample in mg. When the absorbance (A) exceeds 0.7, the amount of sample should be adjusted.

Kremer Pigmente GmbH & Co. KG · Hauptstr. 41-47 · DE-88317 Aichstetten ·Tel. 0049 7565 914480 · info@kremer-pigmente.com · www.kremer-pigmente.com